

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

Reserve

1.96

R31Fsm

LIBRARY
CURRENT SERIAL NUMBER
★ APR 29 1944

U.S. DEPARTMENT OF AGRICULTURE

A

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for the

MISSOURI and ARKANSAS

DRAINAGE BASINS

April 1, 1944

* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *

Issued by the
United States Department of Agriculture
Soil Conservation Service
Division of Irrigation
In Cooperation with
The Colorado Agricultural Experiment Station
Colorado State College
Fort Collins, Colorado

April 10, 1944

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
FOR MISSOURI AND ARKANSAS RIVERS

April 1, 1944

The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Division of Irrigation, Soil Conservation Service, of the U. S. Department of Agriculture, in cooperation with State departments, other Federal bureaus and local organizations. The snow measurements are made principally by field personnel of the following organizations: Forest Service, National Park Service, Bureau of Reclamation, U. S. Geological Survey, War Department and State Experiment Stations. This work is otherwise conducted cooperatively with the State Engineers of Colorado, Nebraska and Wyoming, and various municipalities, irrigation associations, power companies and others. Precipitation records are supplied by the U. S. Weather Bureau.

PRECIPITATION DATA

| WATERSHED | STATE | Precipitation | | Departure from Normal | Precipitation March | Departure from Normal |
|-----------|-------------|--------------------------|--------|-----------------------------|------------------------|-----------------------------|
| | | October 1 to March 31 | Inches | | Inches | |
| Missouri | East. Mont. | 3.29 | 0.41 | -0.41 | 0.76 | -0.03 |
| Missouri | Cent. Mont. | 3.28 | -1.31 | -1.31 | 0.93 | -0.07 |
| Missouri | North. Wyo. | 8.08 | -1.11 | -1.11 | 1.86 | -0.03 |
| Wyoming | Wyoming | 5.39 | -0.21 | -0.21 | 2.20 | +1.06 |
| Colorado | Colorado | 6.17 | -0.16 | -0.16 | 3.13 | +1.56 |
| Arkansas | Colorado | 6.00 | -0.26 | -0.26 | 2.22 | +0.85 |

Precipitation on the watersheds of the North and South Platte and the Arkansas was considerably above normal during March. It was about normal on the watershed of the Missouri and its tributaries in Montana and northern Wyoming. However, the accumulated precipitation from October 1 to March 1 is still below normal on all watersheds except the Arkansas.

SUMMARY OF APRIL 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THOSE OF PREVIOUS YEARS BY WATERSHEDS

| WATERSHEDS | Snow Depth | | Water Content | | Number courses in Nine year | Snow Density | 1944 Water Content in | |
|-----------------------|-----------------|------|---------------|------------------|-----------------------------|--------------|-----------------------|------|
| | Nine year Avg.* | 1943 | 1944 | Nine year Avg. @ | | | 1943 | 1944 |
| | | | | In. | In. | In. | In. | |
| MISSOURI RIVER | | | | | | | | |
| Jefferson River | 36.7 | 49.2 | 35.6 | 11.2 | 17.2 | 9.1 | 6 | 31 |
| Madison River | 50.5 | 78.0 | 44.5 | 18.1 | 29.7 | 15.0 | 8 | 35 |
| Gallatin River | 33.6 | 32.4 | 41.3 | 9.9 | 11.0 | 10.4 | 7 | 29 |
| Missouri River** | 28.1 | 35.6 | 28.3 | 7.9 | 11.0 | 7.2 | 11 | 31 |
| Marias River | 36.9 | 60.0 | 31.5 | 12.6 | 20.5 | 9.0 | 2 | 28 |
| Yellowstone River | 30.7 | 45.2 | 31.8 | 8.6 | 15.0 | 7.6 | 10 | 34 |
| Milk River | 18.2 | 14.3 | 20.1 | 6.4 | 6.2 | 7.1 | 1 | 28 |
| Shoshone River | 51.6 | 80.4 | 46.9 | 15.8 | 31.0 | 13.6 | 2 | 35 |
| Bighorn River | 36.4 | 53.0 | 35.9 | 10.3 | 18.5 | 9.1 | 13 | 31 |
| Tongue River | 15.4 | 8.7 | 27.2 | 3.4 | 1.6 | 5.1 | 1 | 39 |
| Powder River | 26.2 | 34.0 | 30.2 | 5.8 | 9.4 | 5.7 | 2 | 43 |
| North Platte River | 54.7 | 55.2 | 55.0 | 18.0 | 19.9 | 13.8 | 11 | 24 |
| Sweetwater River | 40.2 | 57.1 | 43.6 | 11.1 | 19.9 | 12.0 | 2 | 88 |
| Laramie River | 38.0 | 43.2 | 41.1 | 11.5 | 15.0 | 10.2 | 9 | 111 |
| Cheyenne River | — | — | 32.4 | — | 8.2 | 3 | — | 114 |
| South Platte River*** | 22.7 | 28.1 | 24.4 | 6.0 | 8.7 | 5.5 | 3 | 29 |
| Crow Creek | 14.2 | 3.9 | 25.7 | 4.1 | 1.1 | 6.0 | 1 | 35 |
| Poudre River | 40.0 | 43.8 | 39.7 | 12.3 | 15.0 | 9.9 | 6 | 28 |
| Big Thompson River | 50.9 | 57.3 | 47.6 | 15.2 | 19.6 | 11.4 | 2 | 34 |
| St. Vrain River | 44.9 | 56.4 | 41.0 | 13.2 | 20.2 | 9.5 | 1 | 25 |
| Boulder Creek | 34.0 | 36.0 | 38.8 | 11.0 | 14.3 | 10.4 | 2 | 34 |
| Clear Creek | 50.2 | 58.0 | 46.0 | 15.0 | 21.0 | 12.0 | 2 | 24 |
| ARKANSAS RIVER | | | | | | | | |
| | 35.1 | 33.3 | 32.8 | 10.3 | 10.8 | 9.2 | 10 | 29 |
| | | | | | | | | 32 |
| | | | | | | | | 28 |
| | | | | | | | | 89 |
| | | | | | | | | 85 |

*Some for shorter periods.

**Headwaters of Missouri River

***Above Denver, Colorado.

WATER SUPPLY OUTLOOK
MONTANA

MISSOURI RIVER AND TRIBUTARIES. The water content of the snow cover, at this time, over the headwaters of these streams averages about 85 percent of the past 9-year April first average. For the headwaters of the Missouri the water content, in comparison with this 9-year average, is 90 percent, Jefferson 80 percent, Madison 70, Marias 70, Yellowstone 90 and the Gallatin 105. Last year's snow cover over southern Montana, and in the Yellowstone Park especially, was abnormally heavy and the resulting runoff much above normal. It is expected that this season's stream flow will be generally about normal with the exception of the Gallatin which will likely be above normal and approximate last year's flow. The runoff in Milk River will likewise be above normal. Extreme high water during the snow melting period is not expected for any of these Montana streams. Reservoir storage is generally good with prospects of further accumulations before the start of the irrigation season. Throughout the irrigated areas in these valleys the soil moisture is now fair to good, stream flow about normal. Range and crop conditions good. The outlook for the coming season's irrigation water supply is quite favorable from the standpoint of snow cover and because of the reservoir storage now available, there will be ample water to meet the irrigation needs with a possible shortage late in the season.

WYOMING

SHOSHONE. The recent snow surveys on the headwaters of Shoshone show the water content of the snow cover to be about 25 percent of that a year ago and 85 percent of the past 9-year average. The runoff will fall far short of last year's total flow but will be sufficient to fill the Shoshone Reservoir which now holds 311,500 acre-feet or at about 70 percent of capacity. The outlook for the coming season is quite favorable at this time. The water supply will be ample to meet the irrigation needs and no shortage will occur, however, the draft on storage will be greater this season in meeting the demand for late irrigation. Soil moisture over the Shoshone Project is fair to good at this time and stream flow below normal.

BIG HORN. The snow cover on this drainage is only about one-half in comparison with last year and indicates that this season's runoff will be much less than it was in 1943. At Brook's Lake the present water content of the snow is 17 inches and on Togwotee Pass 20, last year it was 37 and 43 respectively. In Bull Lake and Pilot Butte the combined storage totals 101,000 acre-feet in comparison with 63,000 a year ago. The small reservoirs near Fort Washakie now equal the storage of last year, 8,100 acre-feet. Generally the soil moisture throughout the Wind and Big Horn valleys is good and range conditions also good due to the all-winter snow cover. Stream flow is somewhat below normal but now improving due to the snow melt at lower elevations. The outlook for the coming season's irrigation supply is not especially good when based on the present amount of snow in the mountains but since the reservoir storage is of a substantial amount no serious shortage in the irrigation supply will occur this season.

POWDER AND TONGUE RIVERS. The water content of the snow on these two drainages is now roughly one-half the amount a year ago. Along the valleys of these streams the soil moisture is only fair and stream flow below normal. It is expected that the coming runoff will be sufficient to fill most of the smaller reservoirs fed from these rivers. The coming season's runoff will likely be below normal unless the April and May precipitation results in a substantial increase in the snow cover on the headwaters of these streams.

NORTH PLATTE RIVER. On the headwaters of this stream and its tributaries the present water content of the snow is about 70 percent of the amount April 1st last year. The discharge of this stream at Saratoga for the coming April-July period is estimated to be 400,000 acre-feet. Last year for this same period it was 579,000. The water content of the snow at Old Battle and North French Creek, both at high elevations, averages 24 inches and a year ago it was 37. Storage in the principal reservoirs on the river is now 587,000 acre-feet, a year ago it was 662,000. The present amount of storage is quite substantial as supplemental to the expected lesser flow of the river in meeting the irrigation needs this coming season. Ample water will be available for irrigation this year except a possible moderate shortage late in the season. Minatare and Lake Alice on the Pathfinder Project in western Nebraska have in storage about 15,000 acre-feet or slightly less than one-half the amount last year at this time. Throughout the North Platte valley in both Wyoming and Nebraska the soil moisture over the irrigated area is good to excellent due to the general all-winter snow cover. Range and crop conditions are generally good and stream flow for the most part normal.

SWEETWATER RIVER. The coming runoff in this stream is expected to reach about three-quarter that of last year. A heavy snow cover now exists on the Green and Farris ranges which will add materially to the coming early June runoff in this river. The soil moisture in the upper Sweetwater valley is very good and because of persistent cold weather the stream flow is subnormal.

LARAMIE RIVER. For this drainage the water content of the snow is likewise only 70 percent of last year and about 90 percent of the past nine-year average. Recent storms have very materially improved the outlook for the approaching irrigation season. It is estimated that the runoff at Helm, April-July, 1944, will be 68,000 acre-feet. Last year the flow totaled 97,000 for the same 4-month period. The irrigated area in the Laramie valley now has good soil moisture, the stream flow is normal and because of the snow cover during the past months, the range and crop conditions are fair to good. No shortage in the irrigation water supply is anticipated during the major portion of the season. Late water supply may be deficient.

SOUTH DAKOTA

The snow fall in the Black Hills this winter has been heavy and melting is now occurring with a substantial runoff. Soil moisture is good throughout the irrigated area. The snow covered ranges during the winter have placed a heavy burden in providing feed for livestock. There will be an above normal runoff this season from the Hills. Reservoirs will fill to capacity and the demand for irrigation will be fully met except the possibility of moderate shortage in the late season.

COLORADO

SOUTH PLATTE. Over this drainage, including the many tributaries, the water content of the snow averages about 60 percent of the amount a year ago. The Boulder watershed the greatest having 75 percent and the St. Vrain the least with about 50 percent. The overall condition being about 80 percent of the past nine-year average. The reservoir storage throughout the whole drainage as compared with last year at this time is for the upper Platte 82 percent, Lower Platte 94, Poudre 75, Big Thompson 67, St. Vrain 60 and the Boulder 106. The expected runoff in the Poudre, April-July 1944, will be 200,000 acre-feet. Last year for this same 4-month period it was 268,000. For the St. Vrain the coming flow April-July will be 60,000 acre-feet, last year it was 82,000, and for Clear Creek 125,000 acre-feet. (The April-July 1943, Clear Creek not available). The soil moisture and range conditions are generally good over the entire irrigated area of the South Platte drainage. The overall outlook for the coming season's irrigation supply is fair to good. The streams will reach normal stage during the peak runoff but will not be sustained. Late water will be moderately short with a heavy draft on reservoir storage.

ARKANSAS. On the headwaters of the Arkansas the present water content of the snow is about 85 percent of that a year ago and is 90 percent of the 9-year average. Reservoir storage is now a little less than one-half the amount last year at this time. Unless heavy precipitation occurs during the next two months over this drainage area, not much additional storage will be realized for use this coming season. The winter snows over the valley area have left the irrigated section with good to excellent soil moisture. Spring planting is somewhat delayed because of wet weather. Crop conditions are now good. The outlook for the coming season's water supply for irrigation is quite favorable. The coming April-July runoff at Salida is estimated to be 240,000 acre-feet. Last year it was 343,000. The river stage at maximum snow melt will reach a normal peak and as the season advances the flow will decrease more rapidly than last year. The supply during the late season will probably be short. The storage now available will be largely consumed at the close of the irrigation season.

MISSOURI AND ARKANSAS RIVER WATERSHEDS

Summary of Federal and State Cooperative Snow Surveys
Issued April 10, 1944, at Fort Collins, Colo.

| Main Drainage and No. Snow Course | Local Drainage | State | Locality | Descrip- tion | April 1 Snow Cover Measurements | | | | | |
|---|-------------------|-------|----------------------|------------------|---------------------------------|--------------|----------|-------|-------------------|------|
| | | | | | Elev. Forest | | National | | Av. Water Content | |
| | | | | | Av. @ 1943 | 1944 | Av. @ | 1943 | Av. @ 1944 | 1944 |
| | | | | | In. | In. | In. | In. | In. | In. |
| JEFFERSON RIVER | | | | | | | | | | |
| 6 Camp Creek | Red Rock Cr. | Idaho | 6mi. N. Spencer | 21-13N-36E | 6800 | Targhee | 29.6 | 32.1 | 34.7 | 8.5 |
| 7 Moose Creek | N.Fk. Big Hole | " | 3mi. S. Gibbons P. | 27-27N-21E | 6200 | Salmon | 40.4 | 59.2 | 37.0 | 13.3 |
| 7 East Fork R. S. | Rock Creek | Mont. | 13mi. NE. Sulia | 16-2N-17W | 5400 | Bitterroot | — | 27.6 | — | 9.6 |
| 10 Gibbons Pass | N.Fk. Big Hole | " | Gibbons Pass | 4-2S-19W | 7100 | " | 55.4 | 78.5 | 53.7 | 19.6 |
| 30 Pipestone Pass | Pipestone Cr. | " | Pipestone Pass | 11-1N-7W | 7200 | DeerLodge | 18.4 | 24.2 | 17.0 | 4.9 |
| Elkhorn Hot Spgs. | Wise River | " | 8mi. N. Polaris | 15-4S-12W | 8450 | Beaverhead | 29.5 | 43.4 | 27.2 | 6.5 |
| 31 Storm Lake | Seymour Cr. | " | 15mi. N. Anaconda | 19-4N-13W | 8100 | DeerLodge | 46.7 | 57.9 | 44.0 | 14.2 |
| | | | Average for Drainage | | 36.7 | 49.2 | 35.6 | 13.2 | 20.2 | 10.3 |
| | | | | | | | | 11.2 | 17.2 | 9.1 |
| MADISON RIVER | | | | | | | | | | |
| 2 Astor Creek | Firehole R. | Wyo. | Lewis Lake | 44-3N-10-6W | 7700 | Yel. Nat. P. | 75.4 | 30.0 | 60.9 | 27.4 |
| 8 Lewis L. Divide* | " | " | 7mi. S. Lewis L. | 44-2N-11D-7W | 7900 | " | 100.7 | 155.0 | 74.2 | 38.6 |
| 11 Nord's Basin | Gibbon River | " | Norris Basin | 44-3N-10-7W | 7500 | " | 29.3 | 43.7 | 32.8 | 8.8 |
| 3 Big Springs | South Fork | Idaho | Big Springs | 34-14N-44E | 6500 | Targhee | 40.6 | 75.6 | 51.9 | 18.7 |
| 16 West Yellowstone | South Fork | Mont. | W. Yellowstone | 34-13S-5E | 6700 | Gallatin | 32.4 | 49.6 | 24.4 | 10.8 |
| Twenty-one Mile* | Greyling Cr. | " | 1-11S-5E | 7150 | Yel. Nat. P. | 46.6 | 68.5 | 42.6 | 15.5 | 24.7 |
| Hebgen Dam | Cabin Creek | " | 22-11S-3E | 6550 | Gallatin | 35.4 | 43.4 | 28.8 | 11.6 | 14.6 |
| Valley View | Denny Cr. | Idaho | 7-15N-44E | 6500 | Targhee | 43.5 | 57.5 | 40.6 | 13.5 | 21.1 |
| | | | Average for Drainage | | 50.5 | 78.0 | 44.5 | 18.1 | 29.7 | 13.0 |
| GALLITIN RIVER | | | | | | | | | | |
| Devil's Slide | Hyalite Cr. | Mont. | 14-5S-6E | 8100 | Gallatin | 58.7 | 60.4 | 64.6 | 17.8 | 20.6 |
| Hood Meadow Extn. | " | " | 22-4S-6E | 6600 | " | 26.7 | 27.9 | 36.3 | 7.1 | 8.0 |
| Mystic Lake No. 1 | Bozeman Cr. | Mont. | 31-3S-7E | 6600 | " | 22.7 | 14.5 | 35.7 | 6.6 | 5.3 |
| Mystic Lake No. 2 | " | " | 31-3S-7E | 6600 | " | 23.3 | 15.3 | 35.8 | 6.2 | 5.1 |
| Twenty-one Mile | Gallatin River | " | 1-11S-5E | 7150 | Yel. Nat. P. | 46.6 | 68.5 | 42.6 | 15.5 | 24.7 |
| Ross Peak | Ross Cr. | " | 10-1N-6E | 7000 | Gallatin | 23.7 | 17.5 | 28.7 | 6.1 | 4.9 |
| New World Trail | Gallatin River | " | 13-3S-6E | 7000 | " | 33.7 | 22.4 | 45.6 | 10.0 | 8.3 |
| | | | Average for Drainage | | 33.3 | 32.4 | 41.3 | 10.4 | 9.9 | 11.0 |

*On adjacent drainage

**Readings March 15

†Average for period of record

MISSOURI AND ARKANSAS RIVER WATERSHEDS
Summary of Federal and State Cooperative Snow Surveys
Issued April 10, 1944, at Fort Collins, Colo.

| Main Drainage and Snow Course No. | Local Drainage | State | Location | Description | Elev. | | Apr. 1 Snow Cover Measurements | |
|-----------------------------------|--------------------|--------------|---------------------|----------------------|--------|----------------------|--------------------------------|-------|
| | | | | | Forest | 1943 | 1944 | Av. @ |
| MISSOURI RIVER | | | | | In. | In. | In. | In. |
| 6 Chessman Res. | Tennile | Mont. | 11mi. SW. Helena | 27-8N-5W | 6,200 | Helena | 15.3 | 4.2 |
| 11 Goat Mountain | South Fork | " | 26mi. W. Gilman | 47-5N112-9W | 7,000 | Lewis & Clark | 26.0 | 22.4 |
| 36 Stemple Pass | Canyon Creek | " | Stemple Pass | 16-13N-7W | 6,900 | Helena | 129.1 | 52.3 |
| 41 Tennile Cr. Lower | Tennile | " | 17mi. SW. Helena | 13-8N-6W | 6,250 | " | 21.6 | 21.6 |
| 42 Tennile Cr. Middle | " | " | " | 13-8N-6W | 6,800 | " | 34.0 | 42.6 |
| 43 Tennile Cr. Upper | Grasshopper Cr. | " | " | 19-8N-5W | 8,000 | " | 39.9 | 51.4 |
| King's Hill | Belt Creek | " | " | 6mi. S.W. Spgs. | 7,000 | Lewis & Clark | 19.7 | 24.4 |
| Orville Harris | Musselshell R. | " | " | 19-9N-8E | 7,950 | " | 39.9 | 44.6 |
| Half Moon | Judith River | " | " | 35-13N-7E | 6,500 | " | 19.1 | 21.5 |
| Crystal Lake | Flat Willow Cr. | " | " | 31-10N-9E | 6,000 | " | 24.7 | 24.3 |
| MARIA RIVER | Desert Mountain* | Mont. | 4mi. S. Belton | 22-12N-18E | 5,500 | " | 39.8 | 34.5 |
| 7 | Outbank Cr. | " | Summit | 24-31N-19W | 5,600 | Flathead | 35.1 | 53.8 |
| 20 | Marias Pass | Two Medicine | " | 48-33N13-4W | 5,250 | Glacier NF | 38.7 | 66.3 |
| | | | | Average for Drainage | | | 36.9 | 60.0 |
| YELLOWSTONE RIVER | | | | | | | | |
| 14 | Dome Lake | Wyo. | Dome Lake | 11-53N-87W | 8,800 | Bighorn | 26.6 | 36.5 |
| 40 | Lupine Creek | " | 11mi. SE. Gardiner | 14-9N110-6W | 7,300 | Yel. Nat. P. | " | 48.3 |
| 41 | Blacktail Deer Cr. | " | 11mi. " " | 14-9N110-6W | 7,500 | " | 52.3 | " |
| 43 | Lodge Pole Cr. | " | 34mi. NW. Coisy | 32-56N-106W | 8,200 | Shoshone | 34.0 | 57.8 |
| 3 | Camp Senia | Mont. | 10mi. W. Red Ldg. | 2-8S-18E | 7,670 | Custer | 26.3 | 40.7 |
| 3 | Canyon | Wyo. | 8mi. N. Canyon Jct | 44-7N110-5W | 7,750 | Yel. Nat. P. | 35.6 | 57.8 |
| 3 | Cooke City | Mont. | Cooke City | 25-9S-14E | 7,400 | Absaroka | 25.9 | 43.2 |
| Crevice Mtn. #1 | Soda Butte Cr. | " | 6mi. E. Gardiner | 26-9S-9E | 8,400 | Yel. Nat. P. | 35.4 | 46.8 |
| Crevice Mtn. #2 | Yellowstone | " | 7mi. E. | " | 8,200 | " | 35.4 | 45.9 |
| 7 | Lake Camp | Wyo. | " | " | 7,350 | " | 34.2 | 60.5 |
| | Porcupine Cr. | Mont. | 3mi. NE. Fish. Br. | 44-6N110-4W | 6,500 | Absaroka | 16.9 | 16.9 |
| | Boulder Cr. | " | 12mi. NE. Wilsall | 10-4N-10E | 6,000 | " | 9.4 | 10.5 |
| | Hell's Canyon | " | 26mi. SE. Livgtn | 23-5S-12E | 8,000 | " | 53.0 | 72.5 |
| | Independence | " | 126mi. NE. Gardiner | 22-7S-12E | | Average for Drainage | 30.7 | 45.2 |
| MILK RIVER | Rocky Boy | Mont. | Milk River | 15-23N-16E | | Off Forest | 18.2 | 14.3 |
| | | | | | | | 6.4 | 20.1 |

*Adjacent Drainage

Mont. Bear Paw Mkt.

Mont. Bear Paw Mkt.

MISSOURI AND ARKANSAS RIVER WATERSHEDS
Summary of Federal and State Cooperative Snow Surveys
Issued April 10, 1944, at Fort Collins, Colo.

| Main Drainage and Snow Course No. | Local Drainage and Location No. | State Locality and Description | Mlev. | National Forest | Apr. 1 Snow Cover Measurements Av. Depth Net Content | | | | | | |
|--|---|---|----------------------|----------------------|---|------|-------|------|------|-------|------|
| | | | | | 1943 | 1944 | Av. @ | 1943 | 1944 | Av. @ | |
| SHOSHONE RIVER | Middle Cr. | Wyo. Sylvan Pass | 12-52N-110W | 7100 | Yel. Nat. P. | 42.2 | 69.3 | 37.4 | 12.7 | 24.7 | 10.2 |
| 32 | Sylvan Pass | " 27mi. SW. Cody | 25-51N-106W | .9500 | Shoshone | — | .61.6 | 41.5 | — | 23.7 | 9.5 |
| 33 | Up. Hardpan Basin | Hardpan Cr. | 23-44N-110W | .9200 | Mashakie | 61.1 | 21.5 | 56.4 | 18.3 | 37.3 | 16.9 |
| 50 | Brooks Lake #3* | Shoshone R. | Average for Drainage | .51.6 | 80.4 | 46.9 | 15.8 | 31.0 | 13.6 | | |
| BIGHORN RIVER | Wind River | Wyo. Togwotee Pass | 29-44N-110W | 9600 | Teton | 74.6 | 100.0 | 71.0 | 26.0 | 43.2 | 20.4 |
| 12 | Togwotee Pass | " 15mi. NE. Tensleep | 30-49N-86W | 8300 | Bighorn | 30.1 | 32.9 | 36.1 | 6.7 | 7.7 | 7.2 |
| 13 | Tensleep Cr. | " 14mi. SW. Cody | 32-53N-88W | 8300 | " | 33.8 | 40.3 | 37.8 | 7.6 | 10.4 | 8.7 |
| 16 | Ranger Creek | " Shell Cr. | 11-53N-87W | 8800 | Bighorn | 26.6 | — | 36.5 | 7.0 | — | 10.3 |
| 14 | Dome Lake* | " | 3-31N-101W | 8500 | Washakie | 25.9 | 30.5 | 36.0 | 6.2 | 9.3 | 7.5 |
| 45 | Sawmill Glade | " 15mi. SW. Lander | 23-31N-101W | 9500 | " | 34.2 | 48.7 | 41.9 | 9.4 | 17.1 | 10.6 |
| 46 | Blue Ridge | " 19mi. SW. Lander | 13-30N-103W | 9000 | Shoshone | 40.0 | 57.2 | 42.5 | 11.3 | 19.9 | 11.6 |
| 47 | South Pass | " 42mi. SW. Cody | 28-46N-103W | 8000 | Washakie | 20.6 | 34.2 | 23.7 | 5.4 | 10.1 | 6.2 |
| 48 | Wood River | " 16mi. NW. Dubois | 3-42N-109W | 7500 | " | 23.2 | 46.8 | 16.1 | 6.0 | 14.3 | 4.1 |
| 49 | Sheridan Cr. R.S. #2 | " Sheridan Cr. | 23-44N-110W | 9200 | Shoshone | 61.1 | 91.5 | 56.4 | 18.8 | 37.3 | 16.9 |
| 50 | Brooks Lake #3 | " Wind River | 26-1N-4W | 9000 | Shos. I. R. | 30.3 | 43.2 | 25.3 | 8.0 | 14.3 | 6.2 |
| 51 | St. Lawrence R.S. | " St. Lawrence Cr. | 18mi. SW. Lander | 9500 | " | 39.0 | 48.3 | 41.7 | 10.5 | 15.7 | 9.5 |
| 52 | Mosquito Park R.S. | " Trout Creek | 23-25-3W | 8750 | Washakie | 34.5 | 56.7 | 23.8 | 10.2 | 20.4 | 6.0 |
| 53 | DuNoir | " Wind River | 27-42N-108W | 8000 | " | 25.9 | 59.0 | 14.5 | 7.9 | 21.1 | 3.5 |
| 54 | T-Cross Ranch | " Horse Creek | 1-43N-107W | Average for Drainage | 36.4 | 53.0 | 35.9 | 10.3 | 18.5 | 9.1 | |
| TONGUE RIVER | Goose Cr. | Wyo. Dome Lake | 11-53N-87W | 8800 | Bighorn | 26.6 | — | 36.5 | 7.0 | — | 10.3 |
| 14 | Goose Cr. | " 20mi. SW. Sheridan | 4-53N-86W | 7700 | " | 15.4 | .8.7 | 27.2 | 3.4 | 1.6 | 5.1 |
| 17 | Big Goose Cr. R.S. | " | Average for Drainage | 15.4 | 8.7 | | | | | | |
| POWDER RIVER | Red Fork | Middle Fork | 18-43N-85W | 7500 | Off Forest | 27.2 | 32.3 | 36.3 | 6.4 | 8.9 | 8.1 |
| 30 | Sour Dough | Sour Dough Cr. | 17-40N-84W | 8500 | Bighorn | 25.3 | 35.6 | 24.0 | 5.2 | 9.4 | 3.3 |
| 31 | | | Average for Drainage | 26.2 | 34.0 | 30.2 | 5.8 | | | 5.7 | |

*On adjacent drainage
†Average for period of record

MISSOURI AND ARKANSAS RIVER WATERSHEDS
Summary of Federal and State Cooperative Snow Surveys
Issued April 10, 1944, at Fort Collins, Colo.

| Main Drainage and Snow Course No. | Local Drainage Area and Snow Course | State | Locality | Location | Descrip- tion | Elev. Forest | National Forest | | | | | | Apr. 1 Snow Cover Measurements | | | | | |
|--|---|---------------------|----------|----------------------|----------------------|-----------------|----------------------|------|----------|------|----------|------|--------------------------------|------|----------|------|----------|------|
| | | | | | | | Av. 1943 | | Av. 1944 | | Av. 1945 | | Av. 1946 | | Av. 1947 | | Av. 1948 | |
| | | | | | | | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. | In. |
| 1 | NORTH PLATTE RIVER | Michigan Cr. | Colo. | Cameron Pass | 2-6N-76W | 10300 | Roosevelt | 60.9 | 53.4 | 58.3 | 20.4 | 20.3 | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 | 15.6 |
| 7 | Cameron Pass | 7mi. SE. Rand | " | 7mi. SE. Rand | 24-5N-78W | 9200 | Routt | 34.0 | 29.7 | 32.3 | 10.3 | 6.9 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| 7 | Park View | Rob. Tars Pass | " | Rob. Tars Pass | 21-5N-82W | 9300 | " | 64.8 | 72.0 | 68.0 | 21.6 | 26.9 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 |
| 8 | Columbine Lodge | Grizzly Cr. | " | 5mi. SW. Pearl | 9-11N-82W | 9000 | " | 35.4 | 39.5 | 36.6 | 10.4 | 11.9 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| 51 | Big Creek Lake | Big Creek | " | Willow Cr. Pass | 1-4N-78W | 9500 | Arapaho | 42.4 | 41.0 | 37.0 | 12.2 | 11.0 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 | 8.9 |
| 62 | Willow Creek P.* | Illinois Cr. | Wyo. | Willow Cr. Pass | 24-14N-85W | 8200 | Medicine Bow | 3.5 | 44.8 | 39.9 | 13.9 | 14.9 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 |
| 7 | Bottle Creek | Encampmt Cr. | " | 7mi. SW. Encampmt | 27-14N-85W | 9000 | " | 55.6 | 57.2 | 51.6 | 18.6 | 20.5 | 14.9 | 14.9 | 14.9 | 14.9 | 14.9 | 14.9 |
| 8 | Webber Spring | " | " | 10mi. S. | 29-14N-85W | 9800 | " | 84.9 | 89.5 | 81.5 | 30.3 | 34.9 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 |
| 9 | Old Battle | " | " | 12mi. W. | 27-16N-80W | 10200 | " | 80.8 | 87.1 | 87.5 | 29.5 | 39.4 | 20.6 | 20.6 | 20.6 | 20.6 | 20.6 | 20.6 |
| 37 | North French Cr. | N. French Cr. | " | Cent/Saratoga | 30-16N-80W | 9400 | " | 61.6 | 60.1 | 70.2 | 19.8 | 21.9 | 13.6 | 13.6 | 13.6 | 13.6 | 13.6 | 13.6 |
| 38 | N. Barrett Cr. #2 | Barrett Cr. | " | " | 34-16N-81W | 8400 | " | 38.3 | 32.8 | 42.1 | 10.9 | 10.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| 39 | Ryan Park #2 | " | " | " | " | " | Average for Drainage | 54.7 | 55.2 | 55.0 | 18.0 | 19.9 | 13.8 | 13.8 | 13.8 | 13.8 | 13.8 | 13.8 |
| 29 | SWEETWATER RIVER | 20mi. SW. Lander | Wyo. | 20mi. SW. Lander | 19-30N-100W | 9000 | Washakie | 40.5 | 57.0 | 44.7 | 10.9 | 19.9 | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 |
| 47 | Granier Meadows | 20mi. SW. Lander | " | 19mi. W. | 13-30N-101W | 9000 | " | 40.0 | 57.2 | 42.5 | 11.3 | 19.9 | 11.6 | 11.6 | 11.6 | 11.6 | 11.6 | 11.6 |
| 47 | South Pass | " | " | " | " | " | Average for Drainage | 40.2 | 57.1 | 43.6 | 11.1 | 19.9 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |
| 3 | LARAMIE RIVER | 7mi. NW. Centennial | Wyo. | 11-16N-79W | 10200 | Medicine Bow | 5.5 | 59.0 | 57.9 | 20.5 | 27.7 | 16.7 | 16.7 | 16.7 | 16.7 | 16.7 | 16.7 | 16.7 |
| 11 | Brooklyn Lake | Nash Fork | " | 21-13N-78W | 9200 | " | 32.6 | 29.1 | 40.9 | 9.4 | 9.4 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 | 9.8 |
| 34 | Fox Park | Fox Park | " | 35-15N-72W | 8700 | " | 14.2 | 3.9 | 25.7 | 4.1 | 4.1 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| 35 | Pole Mountain #2* | Soldier Cr. | " | 29-16N-78W | 8700 | " | 27.6 | 34.3 | 29.4 | 8.1 | 13.2 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 |
| 36 | Libby Lodge #2 | Libby Creek | " | 24-16N-79W | 9500 | " | 35.8 | 48.0 | 33.0 | 10.5 | 16.5 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 |
| 4 | Hairpin Turn #2 | Nash Fork | " | 4mi. NW. Chambers L. | 7-8N-75W | 8600 | Roosevelt | 30.6 | 37.6 | 35.1 | 9.1 | 11.7 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 |
| 49 | W. Port. G-P. Tunnel | Laramie R. | Colo. | 10mi. W.R. Feather. | 26-12N-75W | 10200 | " | 45.9 | 57.9 | 48.1 | 13.2 | 18.7 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 |
| 50 | Deadman Hill* | Deadman Cr. | " | 8mi. SW. | 6-9N-74W | 10200 | " | 38.6 | 49.0 | 40.5 | 10.9 | 15.7 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 |
| 71 | Deadman Hill #2* | Deadman Cr. | " | 8mi. NW. Glendevon | 5-10N-77W | 9800 | " | 56.9 | 62.0 | 53.0 | 17.6 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| 88 | Roach | LaGarde Cr. | " | 8mi. NW. Glendevon | Average for Drainage | 43.2 | 43.2 | 43.2 | 43.2 | 43.2 | 43.2 | 43.2 | 43.2 | 43.2 | 43.2 | 43.2 | 43.2 | 43.2 |

*On adjacent drainage

@Average for period of record

MISSOURI AND ARKANSAS RIVER WATERSHEDS

Summary of Federal and State Cooperative Snow Surveys
Issued April 10, 1944, at Fort Collins, Colorado

| Main Drainage and Snow Course | Local Drainage | State | Locality | Description | Elev. | | National Forest | | Apr. 1 Snow Av. @ | | Cover Measurements | | Av. Water Content In. |
|-------------------------------------|------------------------|----------------------|------------------------|----------------------|-------|----------------|--------------------|------|----------------------|------|--------------------|------|--------------------------|
| | | | | | 1943 | 1944 | 1943 | 1944 | 1943 | 1944 | 1943 | 1944 | |
| CHIENNE RIVER | | | | | | | | | | | | | |
| 1 Upper Spearfish | Spearfish Cr., S. Dak. | 21 mi. SW. Spearfish | 21-3N-1E | | | | | | | | | | |
| 2 Upper Castle | Castle Cr. | 11 mi. SW. Deerfield | 24-2N-1E | | | | | | | | | | |
| 3 Deerfield | Silver Cr. | " | 3 mi. NW. Deerfield | | | | | | | | | | |
| SOUTH PLATE RIVER | | | | | | | | | | | | | |
| 14 Hoosier Pass | S. Platte R. | Colo. | Hoosier Pass | 13-8S-78W | 11400 | Pike | 42.4 | 47.4 | 34.4 | 34.4 | 16.0 | 16.0 | 9.2 |
| 15 Fairplay | " | " | Fairplay | 33-9S-77W | 10000 | " | 4.0 | 0.6 | 6.8 | 0.7 | 0.0 | 0.0 | 9.2 |
| 83 Jefferson Cr. | Jefferson Cr. | " | " | 14-7S-76W | 10100 | " | 21.6 | 36.8 | 32.0 | 5.3 | 10.2 | 10.2 | 6.2 |
| CROW CREEK | | | | | | | | | | | | | |
| 34 Pole Mountain #2 | Crow Creek | Wyo. | 10 mi. SE. Laramie | 35-15N-72W | 8700 | Medicine Bowl | 4.2 | 3.9 | 25.7 | 4.1 | 1.1 | 1.1 | 8.2 |
| POUDRE RIVER | | | | | | | | | | | | | |
| 1 Cameron Pass | Joe Wright Cr. | Colo. | Cameron Pass | 2-6N-76W | 10300 | Roosevelt | 60.9 | 53.4 | 58.3 | 20.4 | 20.3 | 20.3 | 15.6 |
| 2 Chambers Lake | Poudre River | " | Chambers Lake | 6-7N-75W | 9000 | " | 23.0 | 29.1 | 20.5 | 7.5 | 9.2 | 9.2 | 5.0 |
| 3 Big South | " | " | 2 mi. E. Chambers L. | 33-8N-75W | 8600 | " | 8.7 | 8.9 | 10.9 | 2.2 | 3.3 | 3.3 | 1.9 |
| 50 Deadman Hill | " | " | 10 mi. W. R. Feather | 26-10N-75W | 10200 | " | 45.9 | 57.9 | 48.4 | 13.2 | 18.7 | 18.7 | 12.2 |
| 65 Lake Irene* | " | " | 1 mi. SW. Milner F. | 8-5N-75W | 10600 | Ry. Mtn. N. P. | 62.7 | 64.4 | 59.9 | 19.7 | 23.0 | 23.0 | 14.4 |
| 68 Hour Glass Lake | Big S. Poudre | " | 2 mi. NW. Pinegreen F. | 18-7N-73W | 9500 | Roosevelt | " | 41.1 | " | 14.6 | 14.6 | 14.6 | -- |
| 71 Deadman Hill #2 | L. S. Poudre | " | 8 mi. SW. R. Feather | 6-9N-74W | 10200 | " | 38.6 | 49.0 | 40.5 | 10.9 | 15.7 | 15.7 | 10.5 |
| BIG THOMSON | | | | | | | | | | | | | |
| 65 Lake Irene* | Big Thompson R. | Colo. | 1 mi. SW. Milner F. | 8-5N-75W | 10600 | Ry. Mtn. N. P. | 62.7 | 64.4 | 59.9 | 19.7 | 23.0 | 23.0 | 14.4 |
| 95 Hidden Valley #2 | Hidden Val. Cr. | " | 9 mi. W. Estes P. | 23-5N-74W | 9550 | " | 39.1 | 50.2 | 35.4 | 10.7 | 16.1 | 16.1 | 8.4 |
| | | | | Average for Drainage | | | 50.9 | 57.3 | 47.6 | 15.2 | 19.6 | 19.6 | 11.4 |

*On adjacent drainage

*Average for period of record

MISSOURI AND ARKANSAS RIVER WATERSHEDS
Summary of Federal and State Cooperative Snow Surveys
Issued April 10, 1944, at Fort Collins, Colo.

| Main Drainage and Snow Course No. | Local Drainage State | Location Locality | Description | Elev. National | | | | | | | | Apr. 1 Snow Cover Measurements | | | |
|--------------------------------------|-------------------------|----------------------|----------------------|----------------|----------------|----------|------|-------|------|------|-----------|--------------------------------|--|--|--|
| | | | | Forest | Av. Depth | Av. 1943 | 1944 | Av. @ | 1943 | 1944 | Av. Depth | Av. Water Content In. | | | |
| 41 Wild Basin | N. St. Vrain R. Colo. | 5mi. W. Allens F. | 24-3N-74W | 10000 | Ry. Mtn. N. F. | 44.9 | 56.4 | 41.0 | 13.2 | 20.2 | 9.5 | | | | |
| 42 Boulder Creek | S. Boulder Cr. Colo. | East Portal | 2-2S-74W | 9400 | Roosevelt | 10.6 | 0.0 | 17.6 | 2.9 | 0.0 | 4.1 | | | | |
| 5 E. Port. Moffat T. | S. Boulder Cr. | 5mi. SW. Ward | 28-1N-73W | 10300 | " | 57.5 | 71.9 | 60.1 | 19.2 | 28.6 | 16.6 | | | | |
| 60 University Camp #2 | N. Boulder Cr. | Average for Drainage | | 34.0 | 36.0 | 38.8 | 11.0 | 14.3 | | 10.4 | | | | | |
| 61 Loveland Pass #2 | Clear Creek | Colo. | 10mi. W. Georgetown | 10100 | Arapaho | 45.9 | 51.2 | 44.5 | 13.3 | 17.9 | 11.4 | | | | |
| 97 Grizzly Peak* | " | " | 1mi. W. Loveland F. | 11250 | " | 54.6 | 64.8 | 47.2 | 6 | 16.7 | 24.1 | 12.7 | | | |
| | | | Average for Drainage | 50.2 | 58.0 | 46.0 | 15.0 | 21.0 | | 12.0 | | | | | |
| 19 Tennessee Pass | Tennessee Cr. Colo. | Tennessee Pass | 21-18S-80W | 10200 | Cochetopa | 35.4 | 31.3 | 30.3 | 9.2 | 11.0 | 8.2 | | | | |
| 21 Twin Lakes Tun. | Lake Creek | 5mi. W. Twin Lakes | 22-11S-82W | 10500 | " | 37.3 | 39.4 | 32.2 | 10.0 | 12.8 | 8.3 | | | | |
| 42 Marshall Creek* | Marshall Cr. | Marshall Pass | 24-48N-6E | 10800 | " | 46.4 | 47.8 | 41.9 | 13.7 | 15.0 | 12.1 | | | | |
| 43 Poncha Creek | " | " | 19-48N-7E | 10500 | " | 37.6 | 40.9 | 33.6 | 11.6 | 13.3 | 10.4 | | | | |
| 72 Whiskey Creek #2 | Whiskey Cr. | Whiskey Cr. Pass | 37-2N105-2W | 10300 | Maxwell Gr. | 24.7 | 11.3 | 21.2 | 7.4 | 3.8 | 7.2 | | | | |
| 74 LaVeta Pass #2* | Cucharas Cr. | LaVeta Pass | 22-28S-70W | 9300 | San Cristo Gr | 26.0 | 19.3 | 30.4 | 7.7 | 4.7 | 9.8 | | | | |
| 78 Four Mile Park #2 | Lake Creek | 3mi. SW. Twin L. | 23-11S-81W | 9700 | Cochetopa | 11.1 | 14.8 | 17.4 | 3.0 | 3.4 | 4.4 | | | | |
| 79 Fremont Pass #2 | E. Fork Ark. R. | Fremont Pass | 2-8S-79W | 11400 | Arapaho | 52.3 | 61.8 | 43.3 | 16.0 | 20.1 | 10.9 | | | | |
| 81 Blue Lakes #2 | Cucharas Cr. | 15mi. SW. LaVeta | 30-31S-69W | 10000 | San Isabel | 21.4 | 10.1 | 22.5 | 5.6 | 2.7 | 6.2 | | | | |
| 92 Monarch Pass | S. Fork Ark. R. | Monarch Pass | 16-49N-6E | 10500 | Cochetopa | 52.1 | 59.4 | 55.2 | 18.4 | 20.8 | 14.5 | | | | |
| | | Average for Drainage | | 35.1 | 33.3 | 32.8 | 10.3 | 10.8 | | | | | | | |

*On adjacent drainage

@Average for period of record

